

REMARKS

Favorable reconsideration of this application is respectfully requested in light of the following remarks.

By way of the foregoing amendments to the specification, the objection indicated on page 2 of the Official Action has been addressed. In particular, reference to the claims has been deleted from the application. Accordingly, withdrawal of the objections to the specification is respectfully requested.

Claims 1 and 5-6 stand rejected under 35 U.S.C. §102(b) as being anticipated by GB 849,255 to *Cermak*. In addition, Claims 1-2 and 5-6 have been rejected under 35 U.S.C. §103(a) as being obvious over *Cermak* in view of U.S. Patent No. 5,365,400 to *Ashiwake et al.* Finally, Claims 1-2 and 5-6 stand rejected under 35 U.S.C. §103(a) as being obvious over *Livingood et al.* in view of *Wettstein*.

The Examiner seeks to rely on *Cermak* for teaching each and every element of the claimed invention. However, *Cermak* fails to disclose that troughs are in the form of spherical cups, as conceded by the Examiner. *Cermak* also fails to disclose that the troughs are in the form of similar rotationally symmetrical forms. As discussed in the specification, the troughs defined in the present invention provide an advantage over "known elements having areas running perpendicular to the wall". See page 7, lines 7-10 of the present application.

It appears that the Examiner is attempting to equate the cylindrical pockets of *Cermak* with the spherical cups or other similar rotationally symmetrical formed troughs as defined in independent Claim 1. However, the cylindrical pockets of *Cermak* have side

walls that run perpendicular to the wall. For example, Figs. 2 and 3 of *Cermak* disclose a wall with cylindrical pockets. In a sectional view, these pockets have a rectangular shape. This shape forms a sharp edge at the base area with a clearance volume and a constant cross-section for the flow-off of cooling air. This configuration results in unfavorable flow conditions and non-homogeneous effect on the thermally stressed opposite side of the wall, and therefore, an inhomogeneous temperature distribution on that side, and thermal stresses in the wall. In the field of turbomachines, such stresses are highly unwelcome.

These disadvantages are avoided by providing the surface, facing the impingement jets, with a number of troughs in the form of spherical cups or similar rotationally symmetrical forms, with one impingement jet per trough. Such an arrangement optimizes both the flowing conditions on the impingement side and the temperature distribution on the planar opposite side. As such, *Cermak* fails to disclose the patentable features of independent Claim 1.

The Examiner seeks to rely on *Ashiwake et al.* for disclosing that which is missing from *Cermak*. However, the combination of these two references is not appropriate. In particular, *Ashiwake et al.* relates to the cooling of semiconductors. A plurality of tabular fins are laminated via spacers, having a central through-hole for feeding a cooling fluid and radial passageways between the fins for flowing the cooling fluids in a radial direction, thereby cooling the fins. In every case, the cooling fluid flows through a channel having a spherical curved contour. The reason for the spherical contour is to produce boundary layer instabilities, that cause vertical vortices and to intensify the convective cooling within the channel. As such, the Examiner's assertion that *Ashiwake et al.* discloses impingement

cooling is simply wrong. In contrast, *Ashiwake et al.* only relates to a convective cooling through curved channels.

In addition, *Cermak* and *Ashiwake et al.* are not from the same field of endeavor, and one having ordinary skill in the art would not be motivated to combine the two references in the manner suggested by the Examiner. In particular, *Cermak* relates to the field of cooling walls of combustion spaces of high thermal stresses, such as combustion chambers, melting chambers and the like. *Ashiwake et al.* relates to the field of cooling of semiconductor chips. These fields are quite different from each other in essential physical parameters, such as temperature, thermal stresses, pressure, mass flows, dimension, materials, and working condition. As such, Applicants submit that one having ordinary skill in the art of combustion chambers would not look to the field of electronic chips for a solution to cooling a wall of combustion spaces. Accordingly, withdrawal of the rejection based on the combination of *Cermak* with *Ashiwake et al.* is respectfully requested.

The Examiner has maintained the rejection of *Livingood et al.* in view of *Wettstein*. For the reasons set forth below, it is submitted that this combination is not appropriate.

In addition to the arguments presented in the response dated December 12, 2002, Applicants provide the following remarks. In particular, the claimed invention recites a wall with an impingement facing side and an opposite planar side, wherein the impingement facing side comprises a characteristic relief structure (with troughs).

Wettstein discloses a wall with an impingement facing side and an opposite planar side, wherein the impingement facing side comprises a characteristic relief structure (with humps). *Livingood* discloses a concave-shaped wall with a concave-shaped impingement

facing side and an opposite concave-shaped side, wherein the concave impingement facing side doesn't comprise any relief-structure, but is smooth. To employ in *Livingood* a plurality of orifices as recognized by *Wettstein*, would lead to a concave-shaped wall with a concave impingement facing side and an opposite concave side, wherein the concave impingement facing side comprises a relief structure with a plurality of impingement orifices. Such a configuration would result in a non-homogeneous cooling effect on the opposite side, which is not the claimed invention. In contrast, the claimed invention is defined by a planar opposite side. As such, a combination of *Livingood et al.* with *Wettstein* would teach away from the invention.

In addition, a mere duplication of parts would not lead to the present invention. In contrast, this would lead to a plurality of connected concave shells. Therefore, neither *Livingood et al.*, nor *Wettstein*, in combination or alone, teach the features of Claim 1.

It appears the Examiner is reconstructing the claimed invention from selected pieces of prior art without the requisite motivation or suggestion. In particular, it appears that the Examiner is picking and choosing elements from each reference, while discarding specific teachings that don't support his position. However, this is impermissible. The Examiner has failed to provide any motivation to modify or combine the references in the manner suggested by the Examiner. The Examiner can not reconstruct the claimed invention from selected pieces of prior art absent some suggestion, teaching, or motivation in the prior art to do so. *Uniroyal, Inc. v. Rudkin-Riley Corp.*, 5 USPQ2d 1434, 1438 (Fed. Cir. 1999).

In addition, it appears that the Examiner has viewed the instant application as a guide for modifying the cited art. However, it is well established that the use of the

application under examination as a guide to modifying the cited art constitutes impermissible hindsight, and may not be used in rejection of the claims. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990). Accordingly, the Examiner has failed to establish a *prima facie* case of obviousness.

For at least the foregoing reasons, it is submitted that the present invention, as defined in independent Claim 1, and the claims depending therefrom, is patentable distinguishable over the applied documents. Accordingly, withdrawal of the rejections of record and allowance of this application are earnestly solicited.

Should any questions arise in connection with this application, or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application, the undersigned respectfully requests that she be contacted at the number indicated below.

Respectfully submitted,

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